1 The earth is warming

What is the problem?

The air temperature at the earth's surface has risen by 1°C since pre-industrial times due to human activity, and most of this warming has occurred in the last 30 years. Leading climate change scientists on the IPCC (Intergovernmental Panel on Climate Change) say that if the current rate of warming continues, the world will reach a temperature rise of 1.5°C by 2040.[1] This is already gravely affecting our planet.

Effects of human-induced global warming

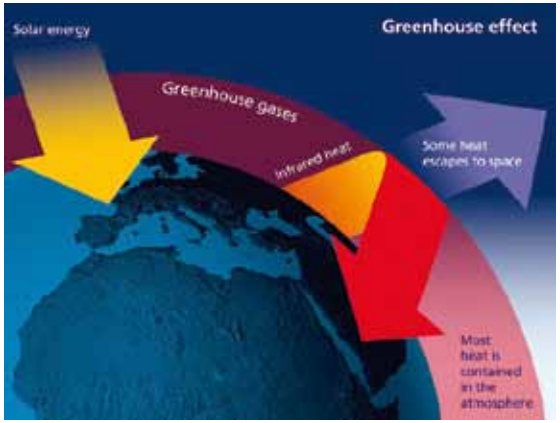
- Glaciers and Arctic ice sheets are melting.
- Rising sea levels are flooding coastal areas.
- Extreme weather events are happening more often.
- Warming oceans are causing huge areas of coral reef to die.

This is affecting all of us, and most of all the poorest people in less economically developed countries (LEDCs).

How is global warming caused?

Earth's temperature goes through natural cycles of warming and cooling over millennia. However, human activities are increasing the amount of greenhouse gases in the atmosphere very rapidly. These gases trap the sun's heat and warm the earth – "the greenhouse effect".

Without the natural greenhouse effect, the earth would be too cold for life. But if too many greenhouse gases build up in the atmosphere because of human activities, life could become impossible for humans and many other species.



[1] *IPCC, SR15, 2018: FAQs.*

Creation is a gift from God

RE

God created the earth and saw that his work was good. *Genesis 1:31*

"God took the man and settled him in the garden of Eden to cultivate and take care of it." *Genesis 2:15*

Creation is beautiful; and not only because it supplies us with resources. God created trees that were pleasant to look at as well as trees to give food. *Genesis 2:9*

The Old Testament people were full of wonder at the power and beauty of creation, reflecting its Creator.
Psalm 148:3-5

They saw themselves as guests on the land: "for the land belongs to me; and you are only strangers and guests of mine." *Leviticus 25:23*

They shared its produce with the poor and held the land in trust for future generations. *Leviticus 23:22; 25:24*

1. Look up the Bible references given. What do they say about how we should treat creation?

2. Find other passages in the Bible that show the beauty of creation.

3. How do you care for creation?

The main greenhouse gases

GEOG

The main greenhouse gas is carbon dioxide (CO_2), produced by burning fossil fuels (coal, oil and gas) and through deforestation (eg. logging and clearing forest for farming). Other principal greenhouse gases are methane, (mostly released from belching cows and flooded rice paddy fields) and nitrous oxide, (mostly from petrol fumes and fertilisers).

1. Explain the greenhouse effect in your own words.

2. What human activities increase the amount of CO_2 in the atmosphere?

3. Would you describe the building of roads in the Amazon as sustainable development? Why / not?

4. What activities could help to reduce these levels?

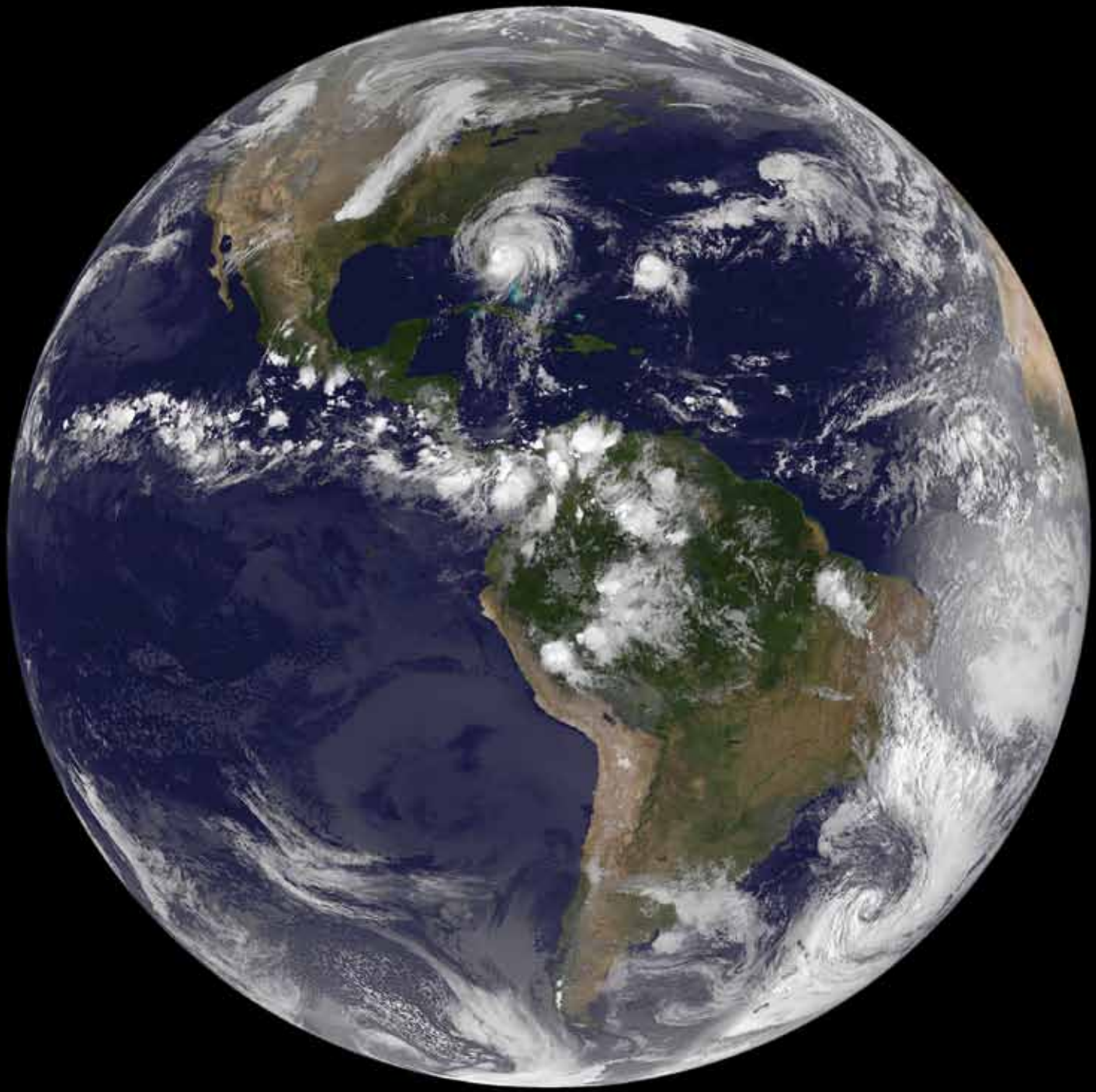
Pause for thought...

Climate change is a global problem with grave implications... It represents one of the principal challenges facing humanity in our day."

Pope Francis, On care for our common home, (Laudato Si'), 25

Action

We are more likely to protect what we truly appreciate. Take a few minutes outside to simply be, to take notice and appreciate the beauty of creation.



1

Photo: NASA

Hurricane Matthew off the US east coast

2 How hot will it get?

What is happening now?

Floods and heatwaves are becoming more frequent as the world warms. The UK hit its hottest-ever temperature of 38.7°C in July 2019. Three years before that, a total of 16,000 UK homes were flooded as winter rainfall hit its highest levels in a hundred years.[1]

Since 1900, sea levels have risen by about 20cm globally. At the current rate of emissions, they will rise at least a further 50cm-1m by the end of this century.[2]

How fast is global temperature rising?

Temperatures are not changing at the same speed everywhere. Warming is stronger on continents, particularly in the Arctic during winter.

- With emissions at present levels, we will hit a 1.5°C rise between 2030 and 2052[3], and we could reach a 3-5 degree increase by 2100.
- In 2015, world leaders committed under the Paris Agreement to keep global temperature rises under 1.5°C (compared with pre-industrial levels) and slash emissions urgently.

Half a degree makes a big difference

Scientists are forecasting a huge difference between the effects of reaching 1.5°C and 2°C of global warming. For example, at 2°C an extra 420m people would regularly be hit by record heat, and ten times as many would be affected by reduced crop yields.[4] This means food and water scarcity, with consequent migration and conflict.

It is widely accepted that any rise in global temperature of 2°C or more would change the environment permanently. This would impact people in poorer countries most of all.

- By 2050, daytime temperatures could reach 50°C in North Africa, affecting food production, health and ecosystems.[5]
- In Central Asia, one third of glaciers could disappear entirely by 2050, meaning less water for agriculture.[6]
- At least 136 megacities, many in South or South-East Asia, would be at risk of flooding.[7]

[1]Met Office. [2]The Royal Society. [3]IPCC, SR15. [4]Ibid. [5]Max Planck Institute [6]World Bank. [7]IPCC, SR15.

Pause for thought...

"At CAFOD we see again and again how years of development work are swept away overnight by extreme weather. The climate emergency is here and now for so many communities we support. The world's poorest people have done the least to cause global warming, but are being hit hardest by its impact."

Christine Allen, Director of CAFOD

God's covenant

RE

Covenant = promise

"I am now establishing my covenant with you and with your descendants to come, and with every living creature that is with you." *Genesis 9:9-10*

If we break God's covenant by harming creation, we risk damaging our relationship not only with the world around us, but with God. We have a responsibility to care for the great gift that God has given us.

If human beings ignore God's covenant with all living things and continue to plunder the earth's resources and pollute its atmosphere, climate change will increase. Each of us has an important part to play.

"Our relationship with the environment can never be isolated from our relationship with others and with God."

Pope Francis, On Care for our Common Home, 119

1. How does harming the earth risk damaging our relationship with God?

2. How have we 'plundered' the earth?

3. What is the most extreme weather you have experienced in the UK?

The greenhouse effect and our changing climate

GEOG

Much of our weather depends on ocean temperatures and currents. As air temperatures rise around the world:

- Polar ice and many glaciers melt.
- Ocean temperatures cool in some places due to melted ice and warm in others due to warmer air. As a result ocean currents slow, quicken or change direction.
- El Niño and La Niña (systems of ocean currents and winds in the Pacific) may change, causing droughts and floods in Indonesia, Australia, the eastern coast of Africa, South America, Canada and the US.
- Tropical storms, which depend on warm seas, are becoming more intense as well as more frequent.

1. Research how higher global temperatures change the climate.

2. Why is it impossible to prove that a particular weather event, like a flood or heatwave in the UK, is the result of global warming?

3. Look up more differences between the impact of a 1.5°C or 2°C global temperature rise.

Action

Calculate your carbon footprint using one of the many online calculators.

2

Photo: Chris Gallagher

Yorkshire floods, 2016

3 Bangladesh: Coastal threat

Low-lying coastal areas in many regions of the world are already feeling the impact of rising sea levels caused by the climate crisis. Asia and the Small Island Developing States are set to be especially badly hit if global warming hits 2°C.

Sea level rise

Bangladesh is one of the countries most vulnerable to sea level rise in the world, due to its low, flat landscape crossed by a system of over 230 rivers and their tributaries which regularly burst their banks. The north is hit by cycles of drought and flood; the south coast on the Bay of Bengal is regularly hit by storms: 60 per cent of the worldwide deaths caused by cyclones in the last 20 years occurred in Bangladesh.[1]

Salinity is rising at an alarming rate in coastal areas of the country because of the rapidly changing climate and river erosion. As salt water penetrates further inland, farmers are being forced to change their farming methods. Storm surges flood their wells with salt water, making it impossible to drink.

Living on the edge

Mahinur lives in south Bangladesh. Her land is surrounded by rivers and is also near the coast. When high sea tides come in, the fields often flood with salt water, making it hard to grow crops. The few ducks she was raising died from drinking this water. The land is exposed to strong winds and driving rain brought by cyclones. Yet recently the river by her house dried up during a drought and all the fish died, removing another source of food for her family.

With help from CAFOD, Mahinur and her neighbours will be supported to learn new livelihoods so they do not rely on only one source of income as the earth warms. But it is not easy. Like so many poor Bangladeshis, Mahinur has nothing to fall back on when natural disasters strike. She is one of the millions of poor people around the developing world who are paying the price of the climate emergency, having done least to cause it. Her story demonstrates that climate change is a poverty multiplier.

[1] *World Bank, Climate Change Knowledge Portal.*

What can creation tell us about God? RE

"You have only to ask the cattle, for them to instruct you, and the birds of the sky, for them to inform you... There is not one such creature who will not know that the hand of God has arranged things like this! In his hand is the soul of every living thing and the breath of every human being!"
Job 12:7-10

"Ever since the creation of the world, the invisible existence of God and his everlasting power have been clearly seen by the mind's understanding of created things."
Romans 1:20

"[God] produced many diverse creatures, so that what was lacking in one expression of his goodness could be made up by another; for the goodness which God has whole and together, creatures share in many different ways."
St. Thomas Aquinas, Summa 47.1

1. What does creation tell us about God's plan for us?

2. Have you ever felt that you experienced God through creation?

3. Caring for people is the best way to care for the planet." Discuss.

Coastal protection GEOG

In some parts of Bangladesh, barriers have been built of boulders and earth to protect the shoreline. In others, coastal mangrove forests break the waves and protect against tidal surges.

However, these barriers are threatened by erosion and storms. Already almost 70 per cent of the country is flooded during heavy monsoons. A sea level rise of 30-45 cm would displace 35 million people from coastal regions.[2]

There is no room for people to retreat to higher areas. Bangladesh has one of the highest population densities in the world, at 3000 per square mile[3], four times that of the UK. That figure excludes the Rohingya refugee camps, where the population density is 218 times higher than the UK[4].

[2] *World Bank Climate Change Portal, Bangladesh.* [3] *World Bank, 2018.* [4] *aidforum.org*

1. Find out about different sea barriers around the world.

2. Much of Bangladesh is at the same height above sea level as London. How might rising global sea levels affect Bangladesh and London? Explain any differences.

3. What do you think is meant by the term 'climate refugee' and how might this relate to Bangladesh?

Pause for thought...

"An old farmer once told me: 'God always forgives, we men and women sometimes forgive, but nature never forgives.' If you abuse her, she gives it back to you."
Pope Francis, Jan 2015

Action

Play our emergency board game 'Flood!' found via the link below.

3

Photo: CAFOD

Mahinur is hit by drought and floods, Bangladesh

4 Global: Tropical storms

Hurricanes, cyclones, and typhoons are all the same weather phenomenon of rapidly rotating storm systems; we just use different names in different places. In the Atlantic and Northeast Pacific, the term "hurricane" is used. In the Northwest Pacific, the term "typhoon" is used. "Cyclones" occur in the South Pacific and Indian Ocean. Tropical storms are becoming more frequent and severe due to global warming.

The poorest people are most affected

Less developed countries bear the brunt when disaster strikes. Over 90 per cent of all deaths from natural hazards occur in low or middle income countries. Compare Hurricane Katrina in the US and Hurricane Mitch in Central America, both Category 5 hurricanes. While nearly 2,000 people died in the former, Mitch claimed 19,000 lives.[1]

The poorest people are more likely to die during extreme weather events. The reasons for this include having low-quality housing that cannot withstand storms; living in high-density urban areas on hazardous land (eg muddy slopes by rivers), and not having early warning systems or disaster preparations in place.

Disaster risk reduction

Cyclone Idai swept across Mozambique, Zimbabwe and Malawi in 2019. It was the second deadliest cyclone on record to hit the southern hemisphere. The catastrophic flooding and winds of up to 120 mph left at least 1,000 people dead and affected 3 million people.[2]

The first job of aid agencies like CAFOD in situations like this is to reach as many people as possible with basic needs such as food, clean water, shelter and hygiene kits. Another storm could happen at any time, so our teams also help prepare communities who live in emergency-prone regions by training them in Disaster Risk Reduction.

We help people to assess their risks, make informed decisions and prepare for future crises. This includes measures such as building stronger homes in less vulnerable positions; planting trees and bushes to lessen erosion during floods; digging dykes and water channels; and putting early warning systems in place. As tropical storms are set to become ever more frequent, being prepared can save thousands of lives.

[1]UN Office for Disaster Risk Reduction. [2]Reliefweb, ACT Alliance.

Pause for thought...

"As stewards of God's creation, we are called on to make the earth a beautiful garden for the human family. When we destroy our forests, ravage our soil and pollute our seas, we betray that noble calling."

Pope Francis, Jan 2015

Creation in other faiths and cultures

RE

"In Maya culture, the Earth is our mother, we are her children. But now we are destroying our Mother Earth and this has global effects." *Virgilio Ramirez, CAFOD partner, Guatemala*

"We regard our survival as an undeniable right. As co-inhabitants of this planet, other species too have this right for survival." *Buddhist declaration on nature*

"Judaism teaches that we are all entrusted with caring for God's world. Today, in the critical phase of this climate crisis, the fate of all life is literally in our hands." *Rabbi Jonathan Wittenberg*

"From Islam's perspective, the earth, the environment is a gift from Allah to humanity." *Imam Qari Assim*

"The rivers are the veins of God, the ocean is his blood, and the trees are the hairs of his body..." *Hindu scripture Srimad Bhãgavatam 2.1.32-33*

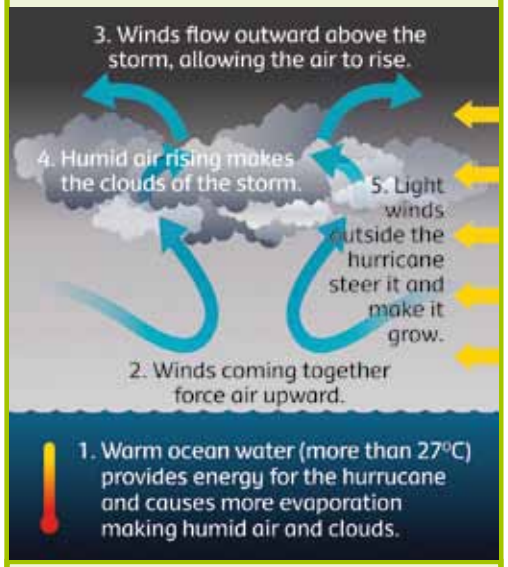
1. Find out what other cultures or faiths believe about caring for creation.

2. What differences did you find with Catholic beliefs?

3. What common elements did you find? Were you surprised?

Formation of a tropical storm

GEOG



1. Explain in your own words how warm oceans cause tropical storms.

2. Suggest reasons to explain why poor communities recover less well after natural disasters.

3. Development means people moving towards better living conditions. How can development help people to be less affected by the changing climate?

4. Research disaster risk reduction and explain it in your own words, giving an example.

Action

Organise an interfaith event or celebration of creation.

Photo: Joost Baastmeijer / Caritas

After Cyclone Idai, Mozambique, 2019

5 Afghanistan: Climate resilience

Afghanistan's living standards are among the lowest in the world, ranking 168 out of 189 countries and territories in 2018.[1] Its harsh physical environment and frequent natural disasters add to the crisis situation of violence and weak governance. Across Afghanistan, 40 per cent of people do not have enough to eat.[2]

At least 230,000 people are affected by natural disasters each year[3], with earthquakes, flooding, landslides, drought and avalanches. The semi-arid land and steep slopes of the Central Highlands have soils that easily erode with wind and water.

Natural resource management

To help farmers conserve water and land, and adapt to climate change, CAFOD links with sister agency Catholic Relief Services (CRS) to build local people's skills. Farmers are led on walks round their land to identify areas worst hit by past disasters, so they can plan ahead.

Farmers have learned to move their cattle around so pasture can grow back, and rotate crops so the soil can recover nutrients. They no longer rip up bushes by their roots for fuel, since this makes erosion worse during snowmelt and flash floods. They are also practising more efficient irrigation and terracing to stop water running off steep land too fast.

"Sometimes we have water shortages, other times floods," explains farmer Tahir Hassani in Ghor province. "It's not easy. The best we can do is to be prepared and that's exactly what we've done."

Better diet

Subsistence farmers in Bamiyan generally rely on just one wheat crop per year, which only gives them food for 4-6 months. With CRS, CAFOD is helping communities to grow vegetables like leeks, onions and spinach. People are now propagating seeds and controlling pests in low cost ways, and storing potatoes in cool, dry conditions so they don't rot.

"It has diversified our diets. We used to mainly eat bread and sometimes meat. What we have now is better for our children," says Tahir.

[1]UN Human Development Report 2018, Statistical Update. [2]Ibid. [3]UN Humanitarian Needs Overview 2017.

Pause for thought...

"Nurturing and cherishing creation is a command God gives not only at the beginning of history, but to each of us. It is part of his plan; it means causing the world to grow responsibly, transforming it so that it may be a garden, a habitable place for everyone."

Pope Francis, 6 May 2013

Water as a religious symbol RE

Life on earth became possible because its atmosphere contained the elements needed to make water. Without water, we would not exist. The human body is made of nearly 70 per cent water.

The writers of the Bible recognised the life-giving properties of water and often used water as a symbol:

"I shall turn the dry ground into a lake, and dry ground into springs of water."
Isaiah 41.18

"Strike the rock, and water will come out for the people to drink."
Exodus 17.6

"Then the angel showed me the river of life, rising from the throne of God."
Revelation 22.1

Water is still used symbolically in the rituals of most of the great religions of the world.

1. Find other places in the Bible where water is used as a symbol of life?

2. What else does water symbolise in sacramental and non-sacramental rituals?

3. Research how water is used in non-Christian faiths.

Soil and water conservation GEOG

Erosion happens when topsoil particles are carried away by wind, snowmelt or water. How badly the land erodes depends on rock and soil types and the amount of plant cover, as well as the weather.

The most extreme form of erosion is desertification, when fertile land is turned into desert. That means less land for growing crops, less food and more hungry people.

As well as preserving bushes that anchor soil with their roots, farmers living in Ghor and Bamiyan provinces in Afghanistan are learning to dig contour furrows and trenches; manage irrigation water better and harvest in stages so not all plants are uprooted in one area at once.

These measures help to limit soil erosion, enhance water capture and make the land more productive. The hills are becoming green again.

1. How can the changing climate contribute to problems of erosion?

2. How can human behaviour worsen the risk of erosion?

3. How can crop rotation improve soil quality and the size of harvests?

Action

Water purification uses energy. Find ways to use less water.

5

Photo: Stefanie Glinski / CRS

Tahir is adapting to climate change, Afghanistan

6 West Bank: Water conflict

The Middle East and North Africa region has the most severe water scarcity problem in the world. People here have one sixth of the global average amount of water per person.[1] With rapid climate change, drought is becoming more frequent and temperatures are rising. Water shortages in the region are further worsened by:

- conflict and unequal distribution of water sources
- population growth and urbanisation
- over-exploitation of resources.

Water and conflict

Clashes over water are becoming a growing problem as the world heats up. The poorest people are the first to lose access to water in areas of political tension. The Israeli-Palestinian conflict is one of the world's longest-standing conflicts. The Israeli occupation of the West Bank and Gaza which started in 1967 is a source of insecurity for both Israelis and Palestinians. Measures adopted by Israel as the occupying power result in lack of access to water for Palestinians, undermining their ability to make a living. As a result they become less able to respond to the changing climate.

Khaled, for example, is a Christian farmer living in Jericho, in the occupied Palestinian territory. He pays five times what his Israeli neighbours living in settlements pay for water. He and his wife Anna sometimes do not have enough to drink.

As his family has less fresh water and are left mainly with salty ground water, they have had to swap from growing bananas to drought-resistant date palms. The change of climate, increasing population and the occupation cause water shortages. "We feel the problem of population," he says. "Building big cities is a problem for the water sources."

Where Khaled used to worry about winter floods, he now suffers drought: "We feel the change of climate. We used to have 7 or 8 days of rain and pray for the sun and now it's the other way around. We pray for the rain."

CAFOD stands in solidarity with all Palestinians and Israelis working for peace with justice. We support the human rights of people in the region who are denied basic needs such as water. "We are treated like we aren't human beings," says Khaled. "We hope for a good peace agreement. I hope for a brighter future."

[1] *UN World Water Week, 2018.*

Pause for thought...

"Pope Paul VI's phrase, 'Development is the new name for peace', specifies one of the keys in our search for peace. Can true peace exist when men, women and children cannot live in full human dignity?"

Saint Pope John Paul II, World Day of Peace, 1987

Renew the face of the earth

RE

"We are partners in God's creative enterprise, called to 'renew the face of the earth' until there is peace and harmony, sparkling life-giving water, the 'trees of life' that give health... shared by all the inhabitants of the earth." *The Call of Creation, 2002*

The gifts of creation are for all to share, not for one group or another to control. We must work for peace and overcome injustice if people and communities in poorer nations are to thrive and move forward.

Saint Pope Paul VI taught that true development is more than just economic progress—it is about the flourishing of the whole person. *On the Development of Peoples, 14*

Pope Francis calls this "integral human development", by which the human person can flourish and grow in all aspects of their life.

1. What does it mean to 'renew the face of earth'?

2. List the things that help people to flourish as whole persons.

3. How can renewing the face of the earth help people to thrive and flourish as complete individuals?

Sustainable development and urbanisation

GEOG

Development seeks to help countries and communities to grow in the areas of industry, technology or economy. At CAFOD we support projects that encourage economic growth without hurting people or the environment.

Sustainable development is defined as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." *Brundtland Report 1987*

Rapid urbanisation—the growth of cities as more people move there or are born in them—can threaten sustainable development. Urban areas are growing fastest in LEDCs.

Uncontrolled urbanisation means that resources like water have to be shared out between more people, a situation made worse by weather extremes resulting from climate change.

1. What sort of economic projects might be described as unsustainable development?

2. Find out some of the reasons for urbanisation in LEDCs.

3. Name some advantages and disadvantages of urbanisation?

Action

Write a class letter to your local MP to explain why you care about the climate crisis and why they should make it a priority.

6

Photo: Farzana Fidai

Jericho landscape

7 El Salvador: Climate monitoring

El Salvador has seen an increase in extreme weather events over the last 30 years – storms, floods and droughts. Human-caused deforestation and land degradation have ravaged the country's farmland and biodiversity, and made variations in its climate more likely. El Salvador's geography is dominated by the Dry Corridor region, prone to recurrent drought and floods. This covers most of the agricultural land. Many farmers, unable to make ends meet, migrate.

The weather man

Farmer Aney in Guaymango, in the west of El Salvador, takes part in climate monitoring. Every day he takes readings on humidity, rainfall and temperature levels and phones the results to a university. Many farmers involved in CAFOD-funded projects across Central America are doing the same. This builds up a long-term record on climate conditions.

Aney also phones the local radio station with the rainfall results. When there is enough water for farmers to plant their crops, the radio broadcasts the news.

Climate resilience

Aney and other farmers are learning how to preserve soil quality and conserve water by planting living barriers of fruit trees to protect against wind, rain and drought. The mangoes, papaya and coconuts they provide bring food and income as well as helping the environment and cooling the local climate.

"The farmers are all impressed with this barrier technique," says Sophie, a CAFOD gap year student who visited. "It really prevents the land drying out and keeps nutrients in the soil."

CAFOD helps train farmers to grow crops using native seeds without costly pesticides and insecticides, increase crop diversity and rotation, and store their crops correctly. Irrigation systems have been installed to preserve water and boost crop yields. In El Salvador as a whole, only 5 per cent of farmland is irrigated[1]

All of these sustainable farming methods together with workshops on climate change aim to help people adapt to the serious impact of global warming in El Salvador and be better prepared for natural disasters.

[1]*USAID Climate change risk profile, El Salvador.*

Patron saint of the environment RE

Francesco (Francis) Bernardone was born in Assisi, Italy in 1182. After a carefree youth he gave up all his possessions, following the Gospel invitation to "sell what you own and give the money to the poor... then come, follow me" *(Mark 10:21-22)*. He lived with his community in the woods near Assisi in poverty and great joy.

Francis cherished all creation as a gift from God and taught his followers to appreciate its beauty.

He wrote a famous poem called *The Canticle of Brother Sun:*
"Praised be you, my Lord,
with all your creatures,
especially Sir Brother Sun,
He is beautiful and radiant
with great splendour;
and bears a likeness of you,
Most High One..."

St. Francis of Assisi is patron saint of the environment and namesake of Pope Francis.

1. Is it essential to care for trees and plants? Why/why not?

2. Who would you name as patrons of the environment in modern times?

3. Write your own hymn of praise for different aspects of creation, starting with Brother Sun.

How do trees affect our climate? GEOG

Tree planting is a highly effective way of slowing down soil erosion, keeping the water table from sinking and improving the climate.

Evaporation and transpiration from leaves cools the surrounding air and makes it more moist, which in turn encourages rainfall (see Card 10).

Trees also contribute greatly to improving air quality by absorbing carbon dioxide during photosynthesis and breathing out oxygen. As long as the trees are not burned down, this carbon is stored and therefore not released into the atmosphere.

The Intergovernmental Panel on Climate Change in their 2018 Special Report estimated that 1bn hectares of trees would need to be planted to limit global warming to 1.5°C by 2050, alongside cutting greenhouse gas emissions.

1. Discuss some of the many benefits of trees.

2. Draw a diagram to show how trees combat the greenhouse effect.

3. Some people say that if we 'offset' our carbon emissions by planting trees, we can continue to live as we are. What are the weaknesses in this argument? Discuss.

Pause for thought...

"Preservation of the environment, promotion of sustainable development and particular attention to climate change are matters of grave concern to the entire human family."

Pope Benedict XVI, Letter to the Ecumenical Patriarch of Constantinople, 2007

Action

Use our slide presentation of St Francis's beautiful prayer in praise of creation, found at the link below.

CAFOD Catholic Agency for Overseas Development

Find more resources and useful links on this topic at:
cafod.org.uk/secondary/climate-environment

Photo: CAFOD

Aney checks his climate change box, El Salvador

8 Zimbabwe: Energy poverty

Energy poverty

Worldwide, over one in ten people has no access to electricity (11 per cent in 2017)[1]. Close to 3 billion people still use inefficient and polluting cooking systems, with serious impacts on human health and air quality.

Everyone needs access to safe, reliable energy, but to step up to the climate crisis, we need a global shift to renewable, efficient energy systems. The energy industry accounts for two–thirds of all global emissions. As low-income countries develop, they must be supported to adopt clean power sources. It makes economic sense: in many parts of the world, renewables are already the cheapest source of electricity.

Sustainable Development Goals (SDGs)

The SDGs, a set of 17 goals to eradicate poverty and protect the planet, were adopted by world leaders in 2015. Goal 7 pledges to provide affordable, sustainable, reliable and modern energy for all by 2030. By 2016, 17.5 per cent of global power consumption came from renewable sources.[2] But we need to move faster to keep global warming below 1.5°C.

The power of the sun

In rural Zimbabwe, eight out of ten people have no mains electricity.[3] Svondo, pictured overleaf, has no mains supply at home. When he tried to do his homework after dark using a paraffin lamp, it made his eyes itchy. Indoor air pollution from fuel lamps, and from cooking with wood or dung, is a bigger environmental killer than malaria or unsafe water.

So his dad Kiniel saved hard for a solar panel and now there is a light bulb in each of their four small rooms. "I want the children to study," he explains. But the family must still prepare meals over an open wood fire in their smoky cooking hut.

Zimbabwe generates 47 per cent of its electricity from fossil fuels. Only 1 per cent of the country's potential for generating solar energy is being utilised.[4] Meanwhile air pollution and deforestation have become major problems, from burning coal and wood.

CAFOD is asking the UK government to stop spending overseas aid on fossil fuel programmes in developing countries and instead support clean renewable energy.

[1]Tracking SDG7, The Energy Progress Report 2019. [2]Ibid. [3]World Bank, 2017. [4]International Renewable Energy Agency, 2018.

Pause for thought...

"The transition to a cleaner, greener future needs to speed up. We stand at a truly 'use it or lose it' moment."

Antonio Guterres, UN Secretary General, 2018

Preferential option for the poor RE

Those who are already feeling the brunt of climate change are the poorest in developing countries. The Church teaches care for creation, not only for the sake of the earth, but for the sake of the poorest and most vulnerable people.

"Those who are oppressed by poverty are the object of a preferential love on the part of the Church." *Catechism, 2248*

This is known as the "preferential option for the poor". It means that we should "prefer" or "opt" to put the needs of the poorest people first.

Saint Pope John Paul II said that the option for the poor affects Christians as they seek to imitate Christ, but it "applies equally to our social responsibilities and hence to our manner of living..." *On Social Concern, 42*

1. What did Saint Pope John Paul II mean?

2. Who are the poorest and most vulnerable in today's world?

3. What do you think Catholics should do about the climate emergency in response to the "option for the poor"?

Renewable energy GEOG

Burning fossil fuels like oil, coal and gas to create energy pollutes the air, is bad for human health and is the main source of harmful greenhouse gas emissions.

Off-grid solar power can help to lift people out of poverty, improve food and water security using solar pumps for irrigation, power businesses, and support health and education services. The cost of a solar panel has dropped 80 per cent since 2009.[3]

Other renewable energy sources are biomass, wind, hydro-power, wave, tidal, and geothermal.

The many advantages of sustainable energy include job creation. By 2018, 11 million people were employed in the renewable energy industry worldwide, double the 2012 figure. The sector is growing fast as technology improves and costs drop.[4]

[3]International Renewable Energy Agency.
[4]Ibid.

1. List the advantages and disadvantages of using each renewable energy source.

2. Why do you think some people may prefer fossil fuels to renewables?

3. Look up the SDGs and find out more about Goal 7 on energy.

Action

Is your school an eco-school? Research ways to be even more eco-friendly and sustainable.

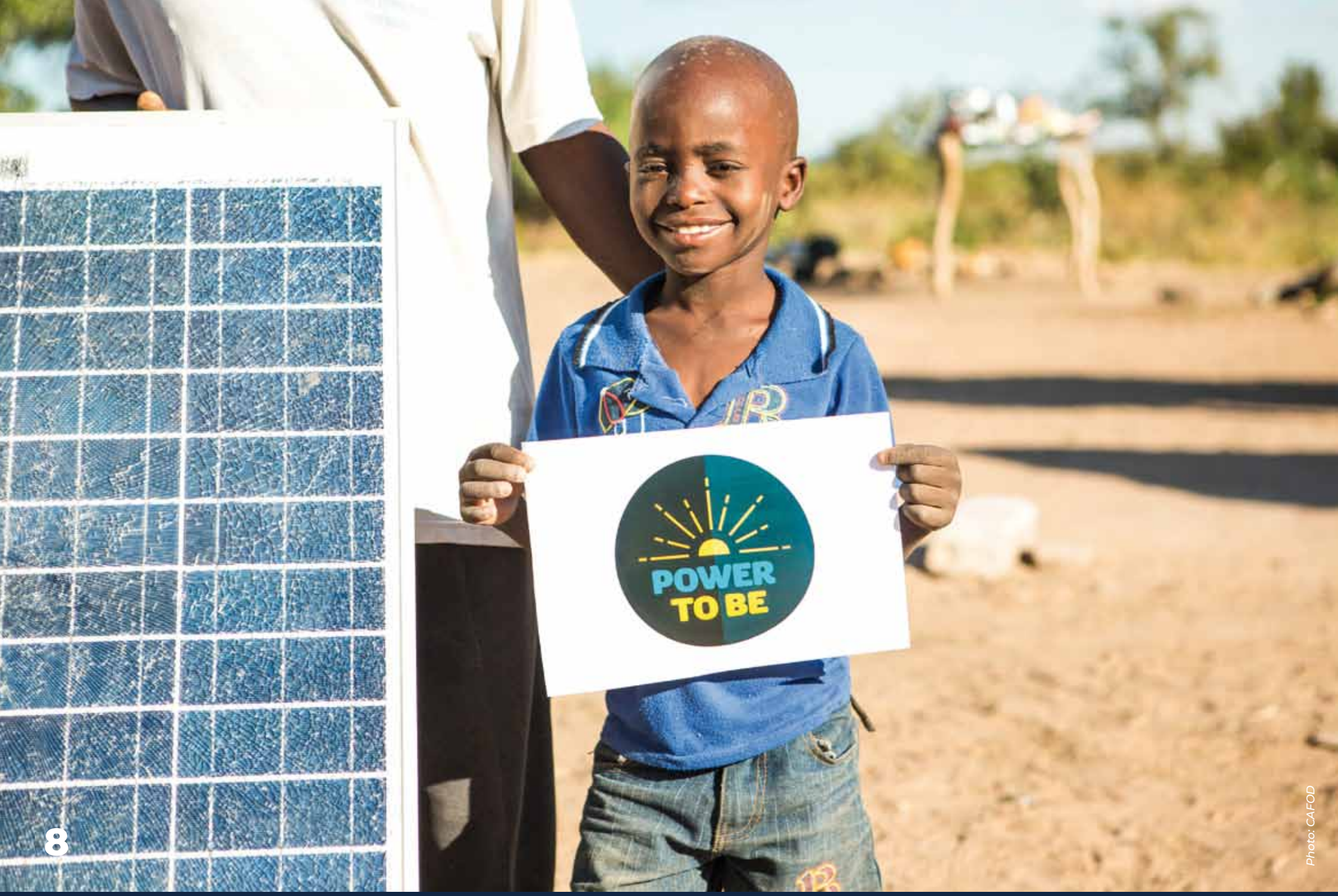


Photo: CAFOD

Svondo with solar panel, Zimbabwe

9 Peru: Water poverty

Peru is one of the countries most vulnerable to the rapidly changing climate. Water shortages are likely to increase sharply in the future. To make things worse, mining and dam building have created widespread damage to the environment and threaten the livelihoods of many farmers. Over a third of Peru's people live in poverty.

A desert city

Lima, capital of Peru, is the second largest desert city in the world (after Cairo). Its ten million inhabitants see less than 1cm of rainfall per year, and rely on three rivers for drinking water. The city's reservoirs only hold enough for 10 per cent of the city's needs.[1]

The water shortage is worsening due to climate change and melting glaciers (see right hand column), as well as increased demand from a rapidly growing population. Lima sits alongside the Andes, the longest continental mountain range in the world, whose geographic features are so extreme that climate models cannot predict future rainfall.[2]

Floods but no water

Around 1.5 million people living in informal settlements have no running water and have to buy water brought in by truck.[3] This is often collected from polluted sources and is stored in big tanks open to the air and dust. It is pricey, up to 11 times the cost of water piped to richer parts of the city.[4] Meanwhile, these poorer communities are at risk of flash flooding and mudslides caused by glaciers in the Andes melting at an alarming rate upstream.

Young people make a change

CAFOD is supporting young Lima residents to become Change Makers when it comes to water. Our local experts are training them to use an urban observatory mobile app, which collects data about their communities' access to drinking water. This data is being presented to Congress in Peru, to lobby for better rights to water in the context of climate change.

Young people like Paolo, (photo overleaf), are learning how to increase resilience to global warming, manage the risks it poses and care for their local environment. Find out more about Paolo's story: see Action.

[1] *World Bank.* [2] *Ibid.* [3] *Ibid.* [4] *DESCO, Peru.*

Pause for thought...

"Our world has a grave social debt towards the poor who lack access to drinking water, because they are denied the right to a life consistent with their inalienable dignity."

Pope Francis, On care for our common home, 30

"If anyone gives even a cup of cold water to one of these little ones who is my disciple, truly I tell you, that person will certainly not lose their reward." *Matthew 10:42*

Water as a human right RE

No-one can live without water. Pope Francis says: "Access to safe drinkable water is a basic and universal human right, since it is essential to human survival and, as such, is a condition for the exercise of other human rights." *On care for our common home, 30*

Not only survival, but dignity and equality are at stake. "Water is not an economic commodity, but an item essential to human dignity," writes Pope Benedict XVI. Earth, water and air are "gifts of creation meant for everyone". *Charity in truth, 51*

Church teaching expresses this as a notion of "common goods"- elements so central to human life that they are for all to share.

Yet the right to safe clean water was not legally recognised by the UN General Assembly until 2010.

1. To some, water is a gift from God and should not be priced. The World Bank argues that charging for water will fund new pipes and facilities and so will increase access to water. Debate.

2. You are a lawyer defending someone arrested for fighting for access to water. What will you say in his or her defence?

Glaciers and climate change GEOG

The world's glaciers are at high risk from global warming.

A glacier is a slow-moving, year-round mass of ice made of compacted snow. Glaciers' white surfaces reflect the sun's rays. When they melt, darker exposed surfaces absorb and release heat, raising temperatures.

When glaciers at the top of mountains melt, this affects water supply downstream and can cause drastic floods and sea level rise.

In Peru, the country's glaciers have receded by nearly 40 per cent in the past four decades. The country lacks dams and reservoirs to capture the water that is released. Meanwhile there is less water for crops and animals, and rivers are drying up in coastal regions.[5]

Other communities around the world that use melt water from glaciers may also see their supply decrease due to climate change, especially in Asia.

[5] *Peruvian National Water Board (ANA), 2014*

1. Explain how glaciers are formed.

2. Do you think it is more important that glacial melt be used to grow crops or to generate hydroelectricity? Why?

3. Why might melting glaciers affect Asia most of all?

Action

Make the poster on the reverse come alive! Download *Zappar* from the App Store or Google Play. Use it to scan the whole poster, including the *Zappar* symbol. Find other stories about Change Makers on our website and bring them to life.

Photo: CAFOD

10 The Amazon basin: Defence of the forest

The rainforests of the Amazon basin are a natural defence against global warming. Their trees and soils store carbon from the atmosphere. But when the forest is destroyed, this "carbon sink" is released as a greenhouse gas (see Card 7). Pope Francis explains that the "richly biodiverse" Amazon biome, which stretches across nine countries, needs special protection because of its importance to all life on earth.[1] Yet the forest is under terrible threat, from the climate emergency and from unsustainable development projects.

Dangers for the rainforest and river

For the last 50 years, roads, dams and mines have been built in the Amazon in an effort to develop the economy. The cost to the rainforest is immense. In Pará state in Brazil, 70 per cent of the forest has been cut down since 1974, mostly illegally, for soya and beef production.[2] CAFOD's local experts describe the burning and deforestation there as "totally out of control". Across the Amazon, 17 per cent of the rainforest has been lost in 50 years.[3]

Weather extremes caused by global warming are hitting the Amazon hard. There has been unusually severe flooding along the Amazon river nearly every year since 2009. Extended droughts in 2005, 2010 and 2015 brought human suffering and impact on ecosystems, as well as an increase in wildfires. Scientists attribute these extremes to deforestation and changing sea temperatures linked to rapid climate change.[4]

Guardians of the forest

Where indigenous and other local communities sustainably manage the forest, biodiversity is better preserved, deforestation is less widespread and people can make a decent living. But many vulnerable peoples in the Amazon suffer intimidation and violence from those who want to use its resources unsustainably. Defending the forest can cost you your life.

Batista, a human rights lawyer whose work CAFOD supports, says his organisation CPT has recorded over 900 murders of rural workers and land rights defenders in 50 years just in his state of Pará: "We are in the middle of a big conflict. On the one side are those who fight to protect the forest and its peoples, on the other, those who want to destroy it."

Yet he hopes that if we join together, we can defend the Amazon and its peoples. "It is possible to keep the forest standing and its peoples within it, without getting in the way of economic growth."

[1]Laudato Si', 38. [2]CAFOD partner figure, 2019. [3]World Wildlife Fund. [4]Science Advances, Sept 2018.

Learning from each other

RE

Pope Francis asks for special care for indigenous communities, who live in a close relationship with the Earth:
"For them, land is not a commodity, rather it is a gift from God and from their ancestors who rest there."
On care for our common home, 146

In the indigenous world view, nature exists in a fragile balance, in which everything is connected. Therefore we should tread lightly upon the earth, taking only what we need. Otherwise the whole circle of life suffers.

As the indigenous people of Guaviare, in the Colombian Amazon, explain: "We are part of nature, since we ourselves are water, air, earth and life of this environment created by God. Therefore we ask for the destruction of our Mother Earth to stop."

1. What can we learn from indigenous people about climate change?

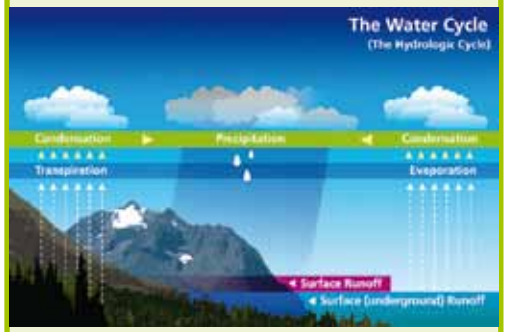
2. What happens to indigenous and other rural communities when forests are destroyed?

3. All human activity depends on natural systems working effectively. Discuss.

The Amazonian water cycle

GEOG

The Amazon river is the largest source of freshwater runoff in the world. This represents 15-20 per cent of global river flow. The Amazon basin is the largest river system on earth. Changes to the Amazonian water cycle have a big impact on the global carbon cycle.



1. Why does Batista say that every one of us has a part to play in protecting the Amazon?

2. Why do some people risk their lives to protect the Amazon? Should they?

3. Would you describe the building of roads in the Amazon as sustainable development? Why / not?

4. How can certain kinds of development make people more vulnerable to the effects of the climate crisis? (See also Urbanisation, Card 6.)

Pause for thought...

"The Amazon is the region with the greatest biodiversity on the planet. Every one of us has a part to play in protecting it and in the struggle against climate change."

José Batista, Land Pastoral Commission (CPT), Brazil

Action

Plant a tree: at home, at school or through CAFOD World Gifts.

Photo: Marcella Haddad / Caritas

Wildfires in the Amazon rainforest, near Apuí, Brazil

11 National and international action

National

In 2019 the UK government set a target of reaching 'net zero' greenhouse gas (GHG) emissions by 2050. This means only putting the same amount of emissions into the atmosphere as we take out. Since 1990 the UK has cut emissions by 42 per cent, yet our economy has grown by two-thirds.[1] Going green makes good sense.

The UK 2008 Climate Change Act aimed to move towards a low-carbon economy and to build international agreement on reducing global GHG emissions. CAFOD campaigned for net zero by 2045 and is now pressing the UK government to ensure that there is no new public support for fossil fuel initiatives overseas.

International

In 2015 world leaders committed to take action to keep global warming to 1.5°C by cutting GHG emissions (see Card 2). The Paris Agreement was a ground-breaking deal, signed by 195 UN member states. Each country must play its part, but it was recognised that richer countries bear more historic responsibility for having caused climate change and should therefore contribute more towards the costs of tackling its impact (see below).

The EU has a collective target of reducing GHG emissions by at least 40 per cent by 2030, compared to 1990 levels, and to ensure that renewable energy use rises to at least 32 per cent. We all need to hold our countries to account.[2]

CAFOD wants international action that puts the world's poorest people first.

- The root causes of the problem must be tackled by cutting GHG emissions.
- Poor communities - who are often hit hardest by global warming – need help to adapt to its impact and benefit from sustainable development.
- LEDCs (less economically developed countries) need international support. This includes climate finance – money used to help reduce emissions and increase resilience against the impacts of global warming. Richer countries have pledged to give money to less wealthy countries who are bearing the brunt of climate change to help them adapt. MEDCs have promised to reach US$100billion per year by 2020 but so far are not on track to meet this target.[3]

[1]UK Committee on Climate Change (CCC) 2016 data. [2]European Commission, 2019. [3]IPCC SR15.

Environmental justice

RE

Since the Industrial Revolution, economically developed countries have produced increasing amounts of CO2, due to use of fossil fuels. This means we owe an ecological debt to those living in countries which did not cause the current levels of global warming. Cutting our carbon emissions is not simply a matter of survival or even of charity; it is a matter of justice.

Catholic Social Teaching (CST) says:

"The climate is a common good, belonging to all and meant for all." *On care for our common home, 23*

"In our use of the environment we have a responsibility towards the poor, towards future generations and towards humanity as a whole." *Charity in Truth, 48*

"Solidarity demands a readiness to accept the sacrifices necessary for the good of the whole world community." *On Social Concern, 48*

1. Why do MEDCs have a responsibility to help LEDCs adapt to the effects of climate change?

2. Find definitions for the CST principles of 'solidarity' and 'stewardship of creation.'

3. How is 'solidarity' linked to 'stewardship of creation'?

What must the world do?

GEOG

There are two necessary responses to the challenge of climate change:

Mitigation — we need to reduce our greenhouse gas emissions to limit global temperature rise.
Adaptation — we must adapt to minimise the negative and use the positive impacts of a changing climate where possible.

Mitigation can include:

- Using less fossil fuel
- Developing more energy-efficient technologies
- Using cleaner sources of energy

Adaptation can include:

- Moving from vulnerable areas
- Flood defences
- Water conservation
- New ways of earning a living
- New methods of agriculture
- Early warning systems

1. Suggest other ways to 'mitigate' and 'adapt'.

2. Of the countries you have studied, which most need to mitigate / adapt, and how?

3. You are representing the UK at the next global climate summit. How will you encourage growing economies to consider climate change in their development?

Pause for thought...

"All of us can cooperate as instruments of God for the care of creation, each according to his or her own culture, experience, involvement and talents."

Pope Francis, On care for our common home, 14

Action

Take campaign action on climate change: cafod.org.uk/secondary/climate-environment

Photo: Craig Cooper

Statue by Antony Gormley looks out at a wind farm, Crosby Beach

12 Public attitudes: What can I do?

The climate emergency is now a top story in the media; but what are the attitudes of people in the street?

Public attitudes are changing

In March 2019 a government poll tracking attitudes of the UK public[1] found:

- 80 per cent said they were either very concerned or fairly concerned about climate change, the highest proportion since the polls started in 2012.
- 7 in 10 said that climate change is already having an impact on the UK.
- 84 per cent supported the use of renewable energy.
- Only 2 per cent did not believe in climate change.

Young people are speaking out

Children and young people worldwide are standing up to political leaders about the climate crisis, joining protests and making their voices heard. In an open letter to *The Guardian* a group of young climate protestors wrote: "We, the young, are deeply concerned about our future. We are the voiceless future of humanity... We demand the world's decision-makers take responsibility and solve this crisis."[2]

Many pupils joined a CAFOD mass lobby of Parliament on climate change and told the BBC's Newsround: "Global warming is the number one threat to our planet" and "We are running out of time to make a difference."

How can we help get to net zero?

- Reducing our own carbon footprint is the first place to start.
- We can tell governments and businesses to take national and international action, especially to fulfil the 2015 global Paris Agreement to cut GHG emissions.

Little changes can make big differences. Did you know:

- Cycling rather than driving three miles saves 2kg of carbon.
- Every cup of liquid boiled means 25 more cups of carbon.
- Plastic carrier bags take up to 500 years to decay in landfill.[3]

[1]BEIS Public attitudes tracker March 2019, UK Gov. [2]Guardian, 1 March 2019. [3]The Sustainability Handbook.

Solidarity and the common good

RE

Catholic Social Teaching says that, in our actions, we should consider "the common good" - the good of each person as part of the community.

We belong to a global community; our choices affect other people and the earth that nourishes us all: "Solidarity requires action to protect the common good at a global level... care for the environment is part of care for the common good."
The Common Good, Bishops of England and Wales, 1996

Living simply, taking only what we need from the earth instead of demanding more and more, is a lifestyle that considers the common good. If we live in this way, alongside caring for our planet we can live in solidarity with the poorest people, so that everyone can reach their full potential as human beings.

1. How can living more simply benefit the common good?

2. Give examples of choices you make which impact on people in other countries.

3. What could you do to live more sustainably, in solidarity with the poorest people?

Can one person make a difference?

GEOG

1. Do a survey of attitudes to climate change in your school.

2. What needs to change in people's attitudes, and why?

3. How might this happen?

4. How might you influence other people's attitudes?

Pause for thought...

"A single question can keep our eyes fixed on the goal: 'What kind of world do we want to leave to those who come after us, to children who are now growing up?"

Pope Francis, 2016

Action

Make a commitment to live more sustainably, and keep to it!

Photo: CAFOD

Mass lobby of Parliament on the climate crisis